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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of

HILL et al.

Serial No. 10/573,671

Filed: March 24, 2006

For: FIBRE-OPTIC SURVEILLANCE SYSTEM

Confirmation No.: 5058

Atty. Ref.: 124-1154

Group: 2874

Examiner: E. Kim

* *

APPEAL BRIEF

On Appeal From Group Art Unit 2874

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01/13/2009 HDEMESS1 00000056 10573671

01 FC:1402 540.00 OP

Adjustment date: 01/13/2009 HDEMESS1
06/10/2008 SZEWDIE1 00000033 10573671
01 FC:1402 -510.00 OP

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* *

January 12, 2009

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

I. REAL PARTY IN INTEREST

The real party in interest in the above-identified appeal is QinetiQ Limited by virtue of an assignment of rights from the inventors to QinetiQ Limited recorded April 20, 2006 at Reel 17838, Frame 738.

II. RELATED APPEALS AND INTERFERENCES

Appellant previously filed a Pre-Appeal Brief Request for Review on April 3, 2008 to which the PTO Panel (Exrs. Kim, Spyrou and SPE Bovernick) decided that the matter should proceed to the Board. An Appeal Brief was filed on

June 9, 2008, which included almost verbatim the points made in the Supporting Statement of the Pre-Appeal Brief Request for Review. However, upon reconsidering (or perhaps considering for the first time) the issues, Supervisor Bovernick forwarded a third official action (non-final), dropping all previous grounds and bases for rejection and instituting new bases for rejection.

III. STATUS OF CLAIMS

Claims 1-16 stand rejected in the outstanding this third PTO rejection. The Examiner contends that claims 1-10, 15 and 16 are now anticipated by Knudsen (U.S. Patent 6,575,033). The Examiner also contends that claims 11 & 12 are obvious over Knudsen in view of Cranch ("Large-Scale Multiplexing of Interferometric Fiber-OpticSensors Using TDM and DWDM" in the Journal of Lightwave Technology). The Examiner also contends that claims 13 & 14 are obvious over Knudsen in view of Kleinerman (U.S. Patent 5,991,479).

The above rejections of claims 1-16 are appealed.

IV. STATUS OF AMENDMENTS

No further response has been submitted with respect to the third Official Action in this application and Appellant chooses option (2) "initiate a new appeal" as identified on page 2 of the non-final official action mailed on October 2, 2008 (Paper No. 20080814) which Notice of Appeal was filed on December 30, 2008.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' specification and figures provide an explanation of the claimed invention set out in independent claim 1 and dependent claims 2 and 15, with each claimed structure and method step addressed as to its location in the specification and in the figures.

1. A fibre-optic sensor array [array 15 as shown in Figure 1 and discussed on page 6, lines 2-5 and elsewhere in the specification] for a surveillance system [perimeter surveillance system 10 as shown in Figure 1 and discussed on page 6, lines 1-5 and elsewhere in the specification], the sensor array comprising:

at least two fibre-optic point sensors [geophones 16A, 16B, . . . 16N as shown in Figure 1 and discussed on page 6, lines 15-20 and elsewhere in the specification and as shown by the photocopy of "Optical Fibre Sensor Technology" by Grattan published 1999 as attached hereto in X. Evidence Appendix]; and

a distributed fibre-optic sensor [distributed sensors 18B, 18C, . . . 18N as shown in Figure 1 and discussed on page 6, lines 11-13 and elsewhere in the specification and as shown by the photocopy of "Optical Fibre Sensor Technology" by Grattan published 1999 as attached hereto in X. Evidence Appendix] linking said at least two fibre-optic point sensors [geophones 16A,

16B, . . . 16N], wherein said sensor array provides an array output of sensed data from said at least two fibre-optic point sensors and said distributed fibre-optic sensor [data link 14 as shown in Figure 1 and discussed on page 6, lines 6-9 and elsewhere in the specification].

2. A fibre-optic surveillance system [perimeter surveillance system 10 as shown in Figure 1 and discussed on page 7, lines 9-18 and elsewhere in the specification] including a fibre-optic sensor array according to claim 1 [array 15 as shown in Figure 1 and discussed on page 6, lines 2-5 and elsewhere in the specification] and further including an interrogation system [interrogation unit 12 as shown in Figure 1 and discussed on page 7, lines 9-18 and elsewhere in the specification], said interrogation system, responsive to said sensed data output from said array indicative of a force applied to at least one of said sensors, for establishing a position at which said force is applied [data link 14 as shown in Figure 1 and discussed on page 6, lines 6-9 and elsewhere in the specification].

15. A method of establishing the position at which an object moving on a surface crosses a path of fixed length, wherein said method comprises the steps of:

(i) positioning a fibre-optic sensor array according to claim 1 [array 15 as shown in Figure 1 and discussed on page 6, lines 2-5 and elsewhere in the specification] adjacent said path; and

(ii) analysing [interrogation unit 12 as shown in Figure 1 and discussed on page 7, lines 9-18 and elsewhere in the specification] optical signals received from the sensor array [data link 14 as shown in Figure 1 and discussed on page 6, lines 6-9 and elsewhere in the specification] to establish the position of the object crossing the path.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-10, 15 and 16 stand rejected under 35 USC §102(b) in the third official action as being anticipated by Knudsen (U.S. Patent 6,575,033).

Claims 11 & 12 stand rejected under 35 USC §103(a) in the third official action as being obvious over Knudsen in view of Cranch ("Large-Scale Multiplexing of Interferometric Fiber-OpticSensors Using TDM and DWDM" in the Journal of Lightwave Technology).

Claims 13 & 14 stand rejected under 35 USC §103(a) in the third official action as being obvious over Knudsen in view of Kleinerman (U.S. Patent 5,991,479).

VII. ARGUMENT

Appellants' arguments include the fact that the burden is on the Examiner to first and foremost properly construe the language of the claims to determine what structure and/or method steps are covered by that claim. After proper

construction of the claim language, the burden is also on the Examiner to demonstrate where a single reference (in the case of anticipation) or a plurality of references (in the case of an obviousness rejection) teaches each of the structures and/or method steps recited in independent claim 1 and dependent claims 2 and 15.

The Court of Appeals for the Federal Circuit has noted in the case of *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984) that "[a]nticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."

In its recent decision, the U.S. Supreme Court in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 (April 2007), held that "[t]o facilitate review [of the Examiner's rationale for combining references], this analysis should be made explicit." The Supreme Court went on to say that it followed the Court of Appeals for the Federal Circuit's advice that "rejections on obviousness grounds <u>cannot be sustained by mere conclusory statements</u>; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness" (emphasis added, the Supreme Court quoting from the Court of Appeals for the Federal Circuit in *In re Kahn*, 78 USPQ2d 1329 (Fed. Cir. 2006)).

A. The Examiner fails to properly construe the Appellants' claim language

The Examiner's agreement, in the "Response to Arguments" portion on page 2 of the third action to, for the first time, properly read the language of Appellants claim 1, i.e., "distributed fiber optic sensor" is appreciated.

The evidence previously submitted with an Amendment under Rule 116 (the identification of the Grattan et al book and the page 4 extract, attached hereto in X. Evidence Appendix, defines "**single point measurement**, i.e., a specific measurement at a particular point in space, or . . . **distributed measurement**, such as can be achieved with the use of optical time domain reflectometry (OTDR)" emphasis in the original). This evidence confirms that the definitions of the claim terms are known in the art.

However, in spite of the fact that this evidence was entered for the purposes of Appeal by the Examiner (as reported in the Advisory Action mailed May 7, 2008), the Examiner still contends that these claim terms are not defined in the specification ("Applicant fails to establish any definition of 'fiber-optic point sensors' or 'distributed fiber-optic sensor' in the specification" third action page 3).

As is well known and stated in the Manual of Patent Examining Procedure (MPEP) §2111.01, there is no requirement that claim terms that are well known to those of ordinary skill in the art be further defined in the specification and in such cases the claim terms are given their "plain meaning" unless this meaning is

inconsistent with the specification. The Examiner has not provided any argument, let alone evidence of record, that the plain meanings of these claim terms is inconsistent with the specification.

"Plain Meaning" is defined in MPEP section 2111.03 as "the ordinary and customary meaning given to the term by those of ordinary skill in the art." This meaning is clearly evidenced as being well known by the Gratten book chapter entitled "Classification of Optical Fiber Sensors" and confirming that these are two well known classes of optical fiber sensors and were known well before the filing date of this application.

The Examiner appears to agree that the claim terms are consistent with the specification because she indicates that examples of the plain meaning of the claim terms are provided and discussed in the specification, i.e., her admissions on page 3 of the official action that the applicant "discloses that fiber-optic point sensors could be geophones as an example (Applicant's specification at page 6, lines 1-5)" and that the distributed fiber optic sensors could "comprise optical fiber packages for measuring pressure on, or bend, of the distributed sensors (Applicant's specification at page 4, second paragraph)."

The evidence of record (and attached in the Evidence Appendix) confirms that the definition of both "point sensors" and "distributed sensors" was well known (in 1999) long before the filing of the present application (in 2006). Since the definitions of these claim terms are well known in the sensor art and consistent

example thereof are admittedly disclosed in the specification, there is no requirement to further define them in the Appellant's specification.

Moreover, the Examiner has made no indefiniteness rejection of any of the present claims as under 35 USC §112 (2nd paragraph). Accordingly, the Examiner should concede that, in view of the documentary evidence which is now of record, that the language of Appellant's independent claims is definite and well known to those of ordinary skill in the art at or before the filing date of the present application.

As required by the MPEP, the Examiner must consider all claim language and demonstrate where the claimed structures and/or method steps are shown in the prior art. The Examiner's failure to consider the known definitions of "point sensor" and "distributed sensor" as defined in the claims is reversible error and notice to that effect is requested.

B. The Examiner misunderstands the teaching of the Knudsen patent

The Examiner alleges on page 3 that Knudsen's "point sensors 22, 24 in fig.2" are a disclosure of the claimed "point sensors" and that Knudsen's "fiber-optic sensor 23, linking said at least two fiber-optic point sensors 22, 24 . . ." (presumably also in fig. 2 of Knudsen) is a disclosure of the claimed "distributed sensor." The Examiner's conclusion appears to indicate the Examiner has not read the Knudsen reference because Knudsen specifically states in column 6, lines 1-15

that all of the referenced items are accelerometers ("The transmission string 20 includes an array of accelerometers 22, 23, 24, 25 as described above connected by transmission cable 28 . . ."). Thus, as clearly stated in Knudsen, in Figure 2, the sensors 22, 24 are identical to sensors 23, 25. Not only does Knudsen not teach two point sensors connected by a distributed sensor, at best it actually teaches four point sensors connected by a transmission cable (and just in case the Examiner reconsiders her position, there is no evidence that the transmission cable 28 comprises a distributed sensor).

Thus, Knudsen does not disclose the claimed two types of sensors interconnected as in the claim, it actually teaches away from the claimed structure and claimed interrelationships. The Examiner's misunderstand of the teaching in the Knudsen patent is reversible error.

C. The Examiner fails to provide any evidentiary support for a rejection of claims 1-10, 15 and 16 under 35 USC §102(b).

As noted above, in order to support an anticipation rejection, a single prior art reference must disclose "each and every element of the claimed invention, arranged as in the claim." As clearly demonstrated, Knudsen only teaches "at least two fibre-optic point sensors" and fails to disclose the claimed "distributed fibre-optic sensor" element. This failure alone confirms that the Examiner has not met her burden of establishing an anticipation rejection over Knudsen.

Additionally, Knudsen fails to teach that the fibre-optic point sensors and the distributed fibre-optic sensor are interconnected as claimed, i.e., said "distributed fibre-optic sensor linking said at least two fibre-optic point sensors." This confirms the Examiner's failure to provide any evidence that Knudsen discloses the "arrangement" of the claimed elements is as specified in the independent claims. This failure is a further confirmation that the Examiner has not met her burden of establishing an anticipation rejection over Knudsen.

As a result of the above, there are at least two failures in the Examiner's proof purporting to support a rejection under 35 USC §102(b). Accordingly, any further rejection of claims 1-10, 15 & 16 as being anticipated by Knudsen is reversible error.

D. The Examiner fails allege that either Cranch or Kleinerman discloses the claimed element of a "distributed sensor" or the claimed arrangement "linking said at least two fibre-optic point sensors" which have been shown to be missing from the Knudsen patent

In the third official action, beginning on page 5 and continuing through page 7, the Examiner, in discussing the secondary references in the obviousness rejections, fails to make any allegation that the claim structure of a "distributed sensor" is disclosed in either Cranch or Kleinerman. Additionally, the Examiner fails to even allege that the claimed "arrangement" of structures is disclosed anywhere in either Cranch or Kleinerman.

E. The Knudsen/Cranch combination do not disclose all of the structures recited in claim 1 or all of the arrangement of structures in claim 1 and therefore there is no *prima facie* case of obviousness

The Court of Appeals for the Federal Circuit has held that "the PTO has the burden under Section 103 to establish a *prima facie* case of obviousness." *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "It can satisfy this burden **only** by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." (emphasis added).

Neither of the Knudsen and Cranch references teach either the structure of a "distributed fibre-optic sensor" or the arrangement of that structure "linking said at least two fibre-optic point sensors" as required by claim 1 and claims 11-12, dependent on claim 1. If the Examiner contends that such structure and such arrangement are disclosed, she is invited to specifically indicate where these are disclosed in any of the references.

Absent a disclosure of all claimed elements and all claimed "arrangements" of elements, even the combinations of the cited prior art references cannot establish a prima facie case of obviousness. The Examiner simply has not met her burden of establishing a *prima facie* case of obviousness and reversal of the obviousness rejection of claims 11 and 12 is respectfully requested.

F. The Knudsen/Kleinerman combination do not disclose all of the structures recited in claim 1 or all of the arrangement of structures in claim 1 and therefore there is no *prima facie* case of obviousness

Neither of the Knudsen and Kleinerman references teach either the structure of a "distributed fibre-optic sensor" or the arrangement of that structure "linking said at least two fibre-optic point sensors" as required by claim 1 and claims 13-14, dependent on claim 1. If the Examiner contends that such structure and such arrangement are disclosed, she is invited to specifically indicate where these are disclosed in any of the references.

Absent a disclosure of all claimed elements and all claimed "arrangements" of elements, even the combinations of the cited prior art references cannot establish a prima facie case of obviousness. The Examiner simply has not met her burden of establishing a *prima facie* case of obviousness and reversal of the obviousness rejection of claims 13 and 14 is respectfully requested.

G. The Examiner fails to meet her burden of providing the Supreme Court required explicit "analysis" of her reasons for picking and choosing elements from the Knudson/Cranch and Knudsen/Kleinerman combination in order to establish a *prima facie* case of obviousness

The failure to establish that the rejection of claim 1 is obvious confirms the failure of any obviousness rejection of claims dependent thereon. As noted above, the Examiner failed to establish that the claim 1 listing of elements and the claim 1

arrangement of elements were disclosed in either the Knudsen/Cranch or Knudsen/Kleinerman combinations. Further more, the Examiner fails to provide the required explicit "analysis" of why one of ordinary skill would pick and choose elements from the prior art and then combine them in the manner of claim 1, let alone claims 11-14, dependent thereon.

With respect to claims 11 & 12, the Examiner, in the second full paragraph on page 6 of the third official action makes the conclusory statement that it would be obvious to modify Knudsen in the manner of Cranch saying that this would improve the device. However, she has not provided anything more than the general conclusion that the combination provides a beneficial result and therefore this is a motivation to combine. Because all patentable inventions must have some beneficial result, with the Examiner's interpretation every combination of patents must be obvious because they are have beneficial results. This is not in accord with the Supreme Court's analysis. Because the Examiner has failed to meet the requirement of the US Supreme court in the rejection, there can be no prima facie case of obviousness and the rejection of claims 11 and 12 should be reversed.

With respect to claims 13 & 14, the Examiner, in the second full paragraph on page 6 of the third official action makes the conclusory statement that it would be obvious to modify Knudsen in the manner of Kleinerman saying that this would improve the device. Again, she has not provided anything more than the general conclusion that the combination provides a beneficial result and therefore this is a

motivation to combine. Because all patentable inventions must have some beneficial result, with the Examiner's interpretation every combination of patents must be obvious because they are have beneficial results. This is not in accord with the Supreme Court's analysis.

Because the Examiner has failed to meet the requirement of the US Supreme court in the rejection, there can be no prima facie case of obviousness and the rejection of claims 13 and14 should be reversed.

H. The Knudsen reference in teaching at best four point sensors, would lead one of ordinary skill in the art away from the claim 1 invention, thereby rebutting any *prima facie* case of obviousness

As noted above, the Knudsen reference, in suggesting four identical point sensors, i.e., accelerometers 22, 23, 24 and 25, clearly teaches away from any benefit of using a distributed fibre-optic sensor at all, or arranging such a sensor to link "at least two fibre-optic point sensors" as required in claim 1, or in claims 11-12, and 13-14, dependent thereon.

Because the Knudsen reference is the primary reference in each of the obviousness rejections and because it teaches away from two aspects of claim 1, from which claims 11-14 all depend, Knudsen clearly rebuts any *prima facie* case of obviousness set out by the Examiner. Accordingly, the obviousness rejections of claims 11-14 have been rebutted and any further rejection should be reversed.

VIII. CONCLUSION

The Examiner has ignored the "plain meaning" of the independent claim terms (as well as the definition in the specification) and thus has committed reversible error. She has misunderstood the teaching of four "fibre-optic point sensors" in Knudsen as including a "distributed fibre-optic sensor." The Examiner thus fails to demonstrate where the claim 1 and 15 requirements of a distributed sensor element and the arrangement of such a distributed sensor "linking said at least two fibre-optic point sensors" and cannot support her anticipation rejection. Similarly, she cannot support her obviousness rejections because even if combined, the combinations do not disclose the claim 1 distributed sensor element or the claimed "arrangement." Moreover, she ignores the fact that Knudsen teaches away from the claim 1 combination of references thereby rebutting any prima facie case of obviousness, even if one had been made (and it clearly has not been made).

As a result of the above, there is simply no support for the rejections of Appellants' independent claim or claims dependent thereon under 35 USC §102 or §103, and in view of the above, the rejections of claims 1-16 under 35 USC §§102 and 103 are clearly in error and reversal thereof by this Honorable Board is respectfully requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: ______________________
Stanley C. Spooner
Reg. No. 27,393

SCS:kmm
Enclosure

IX. CLAIMS APPENDIX

1. A fibre-optic sensor array for a surveillance system, the sensor array comprising:

at least two fibre-optic point sensors; and

a distributed fibre-optic sensor linking said at least two fibre-optic point sensors, wherein said sensor array provides an array output of sensed data from said at least two fibre-optic point sensors and said distributed fibre-optic sensor.

2. A fibre-optic surveillance system including a fibre-optic sensor array according to claim 1 and further including an interrogation system, said interrogation system, responsive to said sensed data output from said array indicative of a force applied to at least one of said sensors, for establishing a position at which said force is applied.

3. A fibre-optic surveillance system according to claim 2 wherein the fibre-optic sensor array is connected to the interrogation system by a fibre-optic cable.

4. A fibre-optic surveillance system according to claim 2 wherein the fibre-optic sensor array is connected to the interrogation system by a transducer and a wire cable.

5. A fibre-optic surveillance system according to claim 2 wherein each of the fibre-optic point sensors comprises optical fibre wound into a flexural disc.

6. A fibre-optic surveillance system according to claim 2 wherein the fibre-optic point sensors are geophones.

7. A fibre-optic surveillance system according to claim 2 wherein each fibre-optic point sensor comprises a fibre-optic accelerometer.

8. A fibre-optic surveillance system according to claim 2 wherein the distributed fibre-optic sensor comprises optical fibre packages within a cable to measure one of pressure on the cable and bend of the cable.

9. The system of claim 2 wherein the interrogation system comprises an interferometric interrogation system.

10. The system of claim 9 wherein the interferometric interrogation system comprises a reflectometric interferometric interrogation system.

11. The system of claim 10 wherein the reflectometric interferometric interrogation system comprises a pulsed reflectometric interferometric interrogation system.

12. The system of claim 11 wherein the pulsed reflectometric interferometric interrogation system employs time-division multiplexing to distinguish individual sensors.

13. The system of claim 2 wherein the interrogation system comprises a Rayleigh-backscatter interrogation system.

14. The system of claim 13 wherein the Rayleigh-backscatter interrogation system comprises a pulsed Rayleigh-backscatter interrogation system.

15. A method of establishing the position at which an object moving on a surface crosses a path of fixed length, wherein said method comprises the steps of:

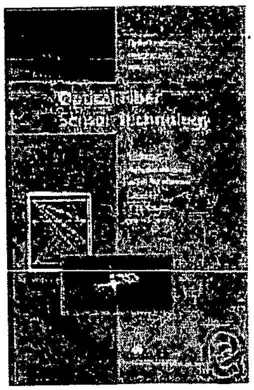
(i) positioning a fibre-optic sensor array according to claim 1 adjacent said path; and

(ii) analysing optical signals received from the sensor array to establish the position of the object crossing the path.

16. A method according to claim 15, wherein the optical signals are analysed by measuring the delay between signals received from adjacent said at least two fibre-optic point sensors along the array and combining these signals with a signal from the distributed fibre-optic array linking said at least two fibre-optic point sensors to locate and confirm said position.

X. EVIDENCE APPENDIX

Appellants submitted a photocopy of "Optical Fibre Sensor Technology" (by Grattan et. al. published 9/1/1999) in the Amendment filed 09/17/07 and this evidence is relied upon above (copy enclosed)



Optical Fibre Sensor Technology: Applications and Systems

Author(s): Grattan, K. T. V.; Meggitt, B. T.
ISBN10: 0412825708
ISBN13: 9780412825705
Format: Hardcover
Pub. Date: 9/1/1999
Publisher(s): Kluwer Academic Pub

Other versions by this Author

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Synopsis

New Price N/A
List Price ~~$204.00~~
eVIP Price $182.18
New Copy: Currently Not Available

Used Price N/A
List Price ~~$204.00~~
eVIP Price N/A

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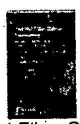
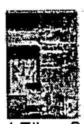
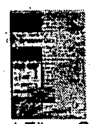


Optical Fiber Sensor Technology: Advanced Applications-Bragg Gratings and Distributed Sensors
Retail Price: ~~$240.00~~
Our Price: $234.06



Optical Fiber Sensor Technology: Fundamentals
Retail Price: ~~$237.00~~
Our Price: $222.78



Optical Fibre Sensor Technology: Chemical and Environmental Sensing
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Our Price: $191.76

Optical Fiber Sensor Technology: Devices and Technology
Retail Price: ~~$223.00~~
Our Price: $209.62

No Image Available

Optical Fiber Sensor Technology
Retail Price: ~~$199.00~~
Our Price: $187.06

Synopsis

Concentrates on the applications of optical fiber sensor technology and systems that rely upon it with a particular emphasis on physical sensors..

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multi-mode and in particular in the relation to interferometric sensors, the temporal degree of coherence of the light in the sensor itself is important, as to whether it be high coherence, low coherence or even incoherent light, which will make a difference to the operation of the device. This distinction arises from the different optical sources used in the sensors themselves.

It is useful to consider the use of several different schematic representations to enable these distinctions to be seen more clearly. Following the pattern of Udd [6], a tree representing subdivisions of both extrinsic and intrinsic fiber optic sensors is shown in Figures 1.2 and 1.3, with Figure 1.4 reflecting the degree of diversity of the subdivision of interferometric fiber optic sensors. The devices considered are intrinsically totally passive sensors, i.e. those which do not require electric power at the sensor head, although a separate group of hybrid sensors exists including bulk, micro-optic or integrated optic elements where an additional power source is used, for example when local electrical powering is provided, often using transduction from optical radiation at the sensor head itself.

In order to be aware of and examine the diversity of the use of fiber optic sensors more fully, the wide range of measurements which can be addressed by fiber optic sensors can be seen, as is tabulated in Figure 1.5 from the work of Jackson [7] where the use of different types of fibers to measure a number of parameters is revealed. This is complemented by Figure 1.6 from the work of Spooncer [3] showing an illustration of the subcategories of one specific group, i.e. multi-mode OFSs in terms of intensity, wavelength or time modulation, as examples.

Further scope for classification of sensors exists using a basis of whether the sensor is making a **single point measurement** i.e. a specific measurement at a particular point in space, or offers the possibility of **distributed measurement**, such as can be achieved with the use of optical time domain reflectometry (OTDR)

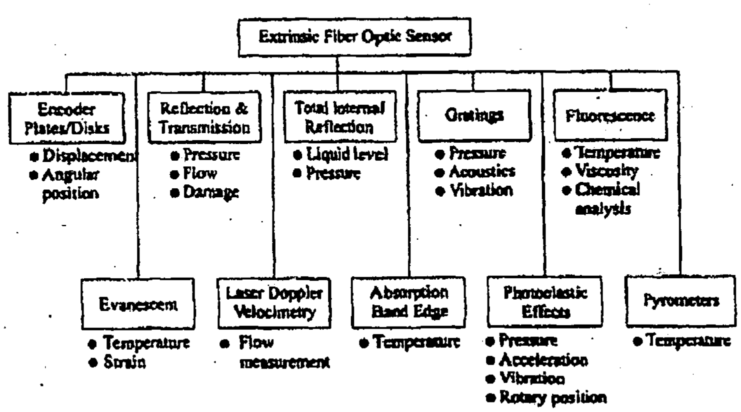

Fig. 1.2 Extrinsic fiber optic sensor applications (after Udd, 1991).

XI. RELATED PROCEEDINGS APPENDIX

None.